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TIN BACKGROUND BRIEFING PAPER

B23

DEMOLITION IN THE OLD QUARTER OF LHASA, 1993

8 November 1994

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Demolition and Reconstruction in the Old Quarter of Lhasa 1993

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> *Most residents in Lhasa, capital of the Tibet Autonomous Region, have moved into spacious and bright apartment buildings and the old bumpy roads have given way to shady streets surfaced with granite stones. During the past few years, the Chinese central government and the local governments of the Tibetan Autonomous Region and Lhasa city have joined hands in allocating large sums of money for the construction of residential buildings and other public facilities in Lhasa. [...]*
>
> *To update old parts of the city, governments at various levels have also spent 92 million yuan on laying more than 100,000 square metres of asphalt roads and building over 20,000 km of sewers and 13,928 metres of water supply pipelines.*[1]

Thus wrote *Xinhua*, the official Chinese news agency, on 14th July 1994. The agency gave examples of the government's work in Lhasa: 103 apartments had been built in 1993, and 331 were due to be built in 1994, a three fold increase, at a cost of 1.2 million yuan.

This report examines in detail the Chinese government's claims concerning housing renovation in the Old Quarter of Lhasa, and describes how that 92 million yuan was spent last year.

This report is based on research material provided by the Alliance for Research in Tibet (ART).

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[1] Xinhua, 14th July 1994, cited in the BBC Summary of World Broadcasts, 15th July 1994 (FE/2048 G/10 [16]). The article said that 3,702 families had benefited from renovated housing in Lhasa since 1979, which had cost the Chinese central government 61 million yuan.

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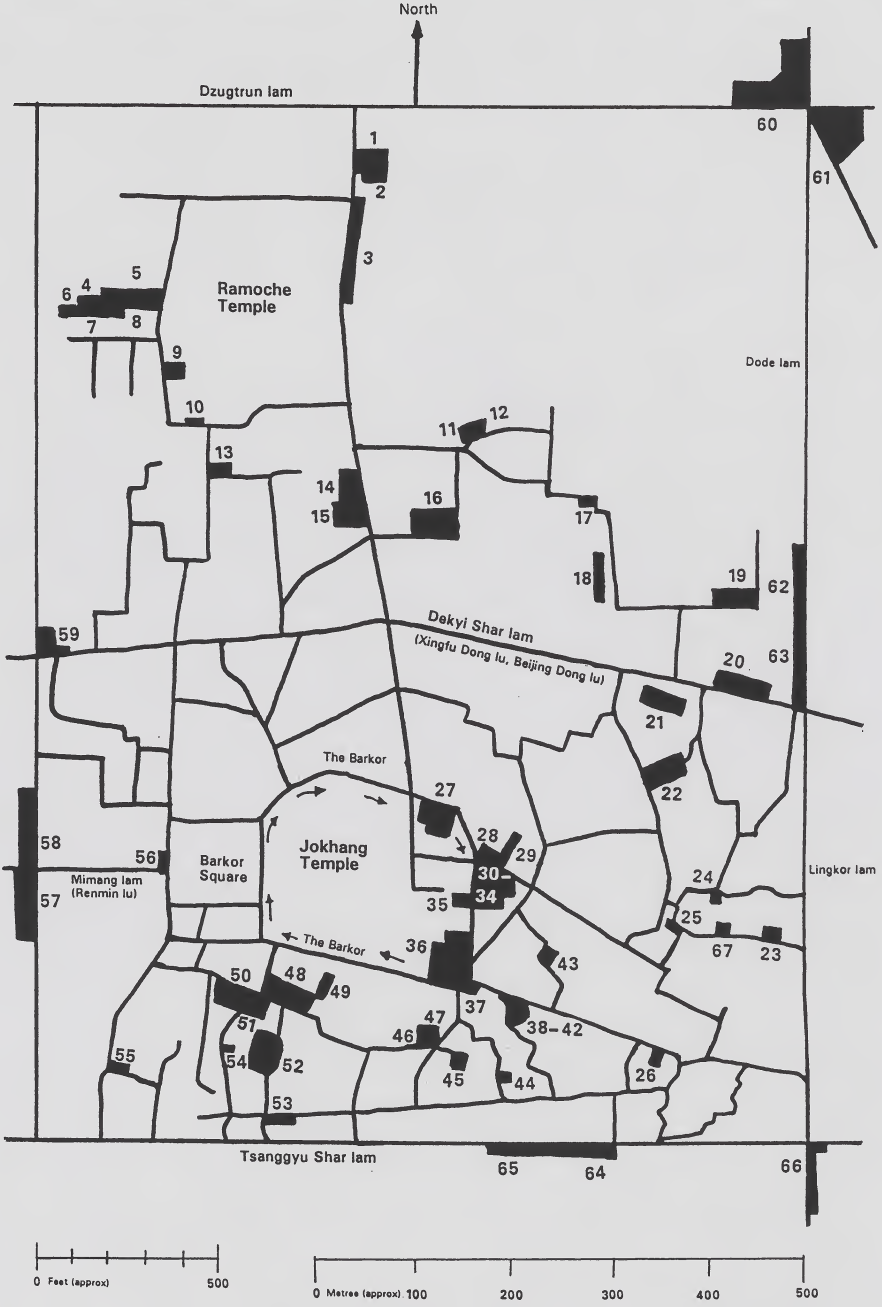

Figure 1: **Construction Sites in the Old Quarter of Lhasa, 1993**

INTRODUCTION

When the Chinese army arrived in Lhasa in 1950 they entered a city that covered 3 sq km in surface area and housed some 30,000 people, almost all of them Tibetans. By 1980 the city had grown to an area of 25 sq km and the population had increased fourfold. Ten years later the city had nearly doubled to 40 sq kms and the population had reached at least 160,000, of whom an estimated 40% were not Tibetan.[1] . By 1994 Lhasa covered 49.62 km, "more than 12 times its pre-liberation size".[2] Half the original city, an intricate maze of alleyways and three storey tapering stone structures, had disappeared and had largely been replaced by utilitarian socialist style cement blocks.

> *Much of the city has become an amorphous mass with ill-defined edges extending well into the rural hinterland. A rectilinear street pattern has been imposed over the original city with little reference made to either historical context or aesthetic sensibilities,*

wrote a group of UN experts in a confidential report prepared for the Tibet Tourism Bureau in 1990.[3]

The urban development of Lhasa which created that "amorphous mass" was concentrated in four intense bursts of activity, according to officials: 1965, 1976, 1985 and 1987-1991. These followed directives issued by the local authorities in line with Beijing's policies of the time, which were variously to create facilities for military, industrial or commercial growth, to remove or neutralise signs of traditional culture, to modernise cities, and, in Tibet, to increase accommodation and facilities for migrant Chinese officials and workers.

The fifth and latest phase of intense urban development in Lhasa took place in the period from 1992 to 1993, and may still be continuing. Ideologically, this phase of development is a reflex of the spring 1992 drive from Beijing for high speed development of the private sector of the economy in China. This led, in Lhasa and other central Tibetan towns, to an artificially induced surge of in the construction of retail outlets, restaurants and lavish offices for trade and commercial organisations, as well as an increase in land ownership, under a system known as user rights, and a steep rise in the value of urban property.

A report by TIN in 1990 studied a small sector of the development activity during the fourth phase of development in Lhasa, namely the construction of new buildings in the traditional area of the city.[4] The 1990 report was based on a survey by a TIN researcher which identified 26 buildings then under construction, mainly a mixture of residential accommodation and shops. About 50 traditional compounds had been demolished to make way for these buildings, with the objective according to the authorities of improving facilities and safety. The survey found little evidence that facilities in the new buildings were an improvement, and noted the resultant social and cultural disruption caused by the demolition of traditional buildings.

The current survey gives a detailed case study taken from the fifth and on-going development phase. Like the 1990 survey, this survey looks at one sector of this development: the construction of new buildings during 1993 in the Old Quarter of Lhasa, the area of less than 1 square kilometre which remains of the original city.[5] In this way it is directly comparable with the 1990 survey, and at the same time it addresses the sector of development which is most likely to impact directly on Tibetan cultural concerns, such as they might be.

The 1993 survey was carried out, as before, by a researcher with specialist knowledge of building techniques and experience of Tibetan urban conditions. As in the earlier study, the method has been quantitative as far as possible, with a strong focus on measurable elements such as the size and dimensions of new apartments, and the exact number of service facilities available within them. The figures were gathered through detailed on-site observation over several months, but cannot be considered as final, since regrettably the survey had to be done clandestinely and without the benefit of official co-operation. The report has sought to avoid subjective observations wherever possible, other than in its conclusions and in a brief and conservative comment on perceived Tibetan attitudes towards the development projects; unfortunately, because of the risks faced by Tibetans speaking to foreigners about sensitive issues, we are unable to gauge with authority the character of Tibetan opinions.

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[1] The official Chinese census figures for 1990 do not give the number of non-Chinese living in the urban area of Lhasa, a figure officials have never revealed. But they do say that 44,939, or 11.9% of the population of Lhasa prefecture, a largely rural area several hundred kilometres across but including the city of Lhasa, are Chinese (*Lasa Wanbao*, 24 November 1990), plus 3,196 other non-Tibetans. Since almost all of this community are likely to be resident in the city, this suggests by deduction that 29.5% of the 162,678 registered population in the Lhasa conurbation in 1990 were non-Tibetans. To this should be added an unknown number of people, especially migrants, who were not registered for purposes of the census.

[2] BBC Summary of World Broadcasts, 14th July 1994. The information was contained in a five-part series of commentaries broadcast by Lhasa Radio under the title "The Communist Party in Tibet: in commemoration of the 73rd founding anniversary of the CCP".

[3] *Tourism Planning and Training for Tibet - Final Report: Project Findings and Recommendations*, United Nations Development Programme and World Tourism Organisation, Volume 1, Madrid, 1990, a confidential report prepared by Shankland Cox of Hong Kong for the Tibet Tourism Bureau. "It is critical that a comprehensive approach covering the conservation of historic buildings and controls of new development be adopted... The Barkhor area has been declared a conservation area. Unfortunately, little is being done to conserve existing buildings," continued the report, which called unsuccessfully for a complete halt to demolitions in the Old Quarter and in the village of Shol.

[4] "Reconstruction in the Old City of Lhasa", *TIN Housing Supplement*, Tibet Information Network, 9th November 1990.

[5] The main area of remaining traditional Tibetan housing is referred to in this report as the Old Quarter of Lhasa. This area is often referred to elsewhere as the Tibetan quarter or the Barkor, from the name of the pilgrimage circuit at the heart of the area. In fact what is left of the Old Quarter extends beyond the Barkor area, north towards Ramoche Temple and west towards the Menzikhang.

Because precise data are not available for the houses which were demolished in 1993 it was not possible to assess conclusively official claims to have improved facilities and accommodation by comparing the new buildings with the older ones. This is because demolitions are carried out with considerable speed and little warning, so that the survey team could not anticipate a demolition. It would anyway have been prejudicial to the safety of residents to conduct even a casual survey of accommodation while it was still in use.

The survey did not cover the 98% of Lhasa which is outside the Old Quarter and where extensive construction activity is known to have taken place during 1993, particularly of shops, bars and commercial offices.[6] This construction, most of which is ultra-modernist in style, did not usually involve demolition of traditional buildings, and so raises different questions from the construction wave in the Old Quarter.

The 1993 Survey: Summary of Findings

Demolitions: The 1993 survey found that a new wave of construction had taken place in the Old Quarter during 1993, and that the construction had involved the demolition of a significant number of the remaining buildings in the quarter, probably the area of greatest historical significance in any Tibetan city. 67 new buildings were under construction, representing an estimated demolition of around 100 traditional Tibetan structures, most of which would have been multi-occupied residences built around a courtyard. This was nearly two and half times the number of new buildings reported in the 1990 survey of the Old Quarter.

Shops and Offices: The survey also found a significant increase in the construction of non-residential building: 17 of the 67 buildings (25%) under construction in 1993 were offices or shops as compared to just two of the 26 (7%) in 1990. Three were large, indoor shopping arcades, all situated on the Barkor itself, the main street for pilgrimage in Lhasa. In addition there was a marked increase in the amount of housing built for private owners or for more `privileged' work units.

These increases were reflected in the amount of public housing accommodation being provided: in 1993 accommodation was provided in public housing for 1,400 people, almost exactly the same as in 1990, when far fewer buildings were constructed overall. There was no increase in the provision of public housing in 1993, despite the much greater number of demolitions, and it is only the provision of commercial buildings and of private and privileged accommodation that has increased. Thus the 100 or so demolitions in the Old Quarter in 1993 have yielded 40 residential sites, of which most are low density accommodation and only 13 are public housing, the only category to which most residents of the Old Quarter could aspire. It seems therefore likely from these statistics that a far smaller percentage of Tibetans evicted from the Old Quarter in 1993 will have even a theoretical chance of being rehoused in their traditional area than was the case in 1990.

Private Housing: The 1993 survey found that the there was a major increase in construction by private Tibetan owners of property - 19 of the 67 projects were of this type. The privately owned projects were of a high standard in provision of space and facilities, and were also distinctive from government sites in that they used traditional Tibetan methods of construction, with the work being done by Tibetan craftsmen and labourers. These buildings were described by the survey team as in keeping with the character of the neighbourhood.

Structure and appearance: In terms of style and design, the Chinese authorities have made a considerable and impressive effort to keep the exterior appearance of new buildings in the Old Quarter in keeping with the visual character of the area, as required by Chinese law, and Tibetan cosmetic additions have accordingly been added to the exterior of all new buildings in the quarter, making them indistinguishable to casual tourists. However, these additions are entirely superficial and the structural design and choice of materials of these buildings remains heavily influenced by modern Chinese conventions, involving the use of pre-cast concrete slabs, single layer walls and large windows - all features which are unsuited to the climatic conditions in Tibet, likely to deteriorate rapidly and to encourage damp and cold, as well as being alien to the cultural tradition. Tibetan materials and methods are greatly superior in these respects, and are nearly always used in the new private Tibetan buildings.

More visible is the increasing tendency of builders to construct properties in the Old Quarter which are taller than the Jokhang Temple, the historic centre of the area and the central shrine in Tibet. The Temple is equivalent in height to three storeys, and no traditional buildings overshadow it. But, despite Chinese laws forbidding the practice in the vicinity of a "cultural relic", one new building erected in 1992 in the Old Quarter was four storeys high, and three of the buildings put up in 1993 are four storeys.

Facilities and Services: The 1993 survey found that in terms of facilities and services the new premises offer little or no improvement over the Tibetan buildings that were demolished rather than refurbished. This contradicts Government claims that old buildings had to be demolished to improve water and sewage amenities. There has been little or no improvement in standards of construction or of facilities in these new premises compared since the previous TIN survey and in some cases, particularly water, electricity and drainage supplies to public housing units, there has been a marked decline in standards since 1990, with more people sharing fewer facilities. It is estimated, for example, that in the new public housing units built in 1993 the average number of people sharing one tap will be 87, over double the 1990 average of 41. In some cases over 100 people will have to share a single tap as their sole source of water. In almost all cases facilities for sewage disposal in the 1993 buildings are worse than they were in the traditional buildings.

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[6] A report published in April, 1994 by a Washington-based group, the International Campaign for Tibet, provides a photographic record of some of this construction activity in areas of Lhasa outside the Old Quarter. A more detailed report is under preparation by the Berlin-based (*?) cultural research organisation, *Kyicho Kuntun*.

Safety: The survey team also found that standards of safety and hygiene in the new buildings had deteriorated since the earlier survey. The most severe danger is that the new buildings are badly constructed and could collapse in the event of an earth tremor because of the weakness of columns, beams and pre-cast sections. In some cases pre-cast concrete slabs had not been properly grouted into position or anchored, and some slabs had only 5 cms (two inches) overlap with a supporting beam, about half the distance required for safety. Moderate earth tremors, which are not unusual in Tibet, could easily cause precast sections to slip from supporting beams or walls where the overlap is insufficient. The report of dangerously low construction standards in new buildings in Tibet has since been confirmed by other building experts who have worked in the region.

Fire or injury from inadequate and badly fitted electrical installations were also considered a high risk by the survey team, who found that the provision of electricity was very low in public housing - usually 1 amp per apartment, compared to 20-30 amps in privileged housing. Such low provision encourages people to override safety systems, specifically by by-passing fuses, a practice which is commonplace in Lhasa.

Installation of wiring in the new buildings was dangerous, according to the team, who noted that all wiring in public housing, including exterior wiring, was surface-mounted and had no shielding, even where the wiring was exposed to harsh weather conditions. The insulation appeared to be of poor quality and was likely to break down rapidly. Wires were joined by tape and much of the wiring was within reach of children.

Hygiene: Hygiene standards seemed to be declining, with fewer drainage points provided than in the 1990 buildings, along with fewer sources of water supply, making it more likely that waste waters will simply be poured out into courtyards. Drains and pipes are likely to get blocked or flooded and to discharge effluent into high-use public areas, and the mixing of sanitary and faecal sewerage systems make this a particularly serious health problem. Children are particularly at risk because they often play in areas which would be flooded by effluent. Almost all the government buildings have installed Chinese-style waste collection pits for toilets which become open sewers if they overflow, and which are much more prone to flooding and collapse than the traditional Tibetan toilet system.

Use of Tibetan Labour: The surveyors looked at the use of local skills and labour in the construction projects, and found that Tibetans supplied most of the unskilled labour on the projects covered by the report, working on three quarters of the building sites in the Old Quarter. Most skilled labourers, however, were Chinese. Although Tibetan craftsmen provided 90% of the skilled labour used on private Tibetan construction sites in the Old Quarter, on government building sites only about 20% of the skilled workers were Tibetan. Outside the Old Quarter nearly all skilled labour is done by Chinese workers. These figures are based on casual observation but support concerns among Tibetans that Chinese rather than Tibetans are benefiting from economic development in Tibet.

* * *

THE SURVEY

Location of the Old Quarter

The Old Quarter of Lhasa comprises a central section and a northern section. The two are divided by a modern Chinese-made road called Dekyi Shar Lam. The central section, about 700 metres by 400 metres, comprises the neighbourhood within and surrounding the Barkor, the circular pilgrim path which runs around the Jokhang Temple.

This area is separated from the Chinese or modern parts of the city by four major roads: on the south by Tsang-gyu Shar Lam, on the east by Lingkor (also called Dode or Dhodi) Lam and on the west by an unnamed street at right angles to Mimang Lu and running in front of the Tibet Daily offices. The northern perimeter of the Barkor area or central section of the Old Quarter is formed by Dekyi Shar Lam.

The northern section of the old city stretches for about 300 metres north of Dekyi Shar Lam towards Ramoche Temple. In this section of the old city the remaining traditional buildings are clustered around the temples of Zhide Dratsang, Tsomonling and Ramoche, and behind Gyurme and Muru Temples.

The area north of the Mentsikhang, the traditional medicine hospital, also remains part of the old city, although the area between the Mentsikhang and the western face of the Jokhang Temple was demolished in a major redevelopment exercise in 1985 to make way for the construction of the Jokhang Square and its surrounding shops and police stations. The other prominent section of Lhasa which has retained its traditional architecture and street-layout is the village of Shol, at the southern foot of the Potala Palace. The village, which is scheduled for entire demolition, is some distance to the west of the Old Quarter and is not included in this report.[7]

The Chinese Government's Development Plans for Lhasa

In the mid-1980s the Chinese Government produced plans for the development of Lhasa in the two decades up until the year 2000. The plans were produced in compliance with the guidelines on municipal planning issued by the Chinese Communist Party Central

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[7] "Construction of the Potala Palace Square" on the site of Shol village began in Lhasa on 18th October 1994, according to *Xinhua* (SWB 23 October 1994; FE/2133 G/12 [12]). It will be 600 x 400 m and is expected to cost 110 mln yuan, said *Xinhua*.

The plans, which were not intended for public circulation, have been cited by officials as the basis of the present developments. Finalised in 1985, they describe Lhasa both at that time and as it was expected to appear by the year 2000.

> *The population of the city has developed from 30,000 at the beginning of the liberation to some 110,000 now. The built-up area has increased from less than 3 square kilometres to 25 square kilometres. The newly constructed area is 10 times that of the Old Quarter. A basic framework is being established for the city, stretching to the northwest....*
>
> *By the year 2000 the population should be controlled so as to be 200,000. The area for construction should be 42 square kilometres by this time. Attention must be paid to the need to construct a modern socialist city with local national characteristics. Lhasa must therefore be built up in a gradual and rational way conforming to the following criteria; well-structured, full of national characteristics, with lots of trees to provide a congenial environment, etc., to create a city that is relatively perfect, beneficial for production, convenient for daily life, rich, civilised and clean.*

Development has in fact gone faster than predicted by the plan. By 1991 Lhasa already covered 40 square kms, reaching over 49 sq kms by 1994, according to official figures, and the official population of Lhasa was already 160,000 by 1990; some unofficial sources estimate that the population target of 200,000 may have already been met. In 1992 a new central policy from Beijing legitimised the mass construction at high speed of shops and commercial premises, a development which must have been well beyond the imagination of the planners seven years earlier. According to the official paper *Tibet Daily* (31st January 1994) the number of individually owned enterprises in the Tibet Autonomous Region shot up from 489 in 1980, when communes were disbanded, to 41,830 by the end of 1993; 5,300 "individually run enterprises" were set up in Lhasa alone, an increase of 56% on 1992, and 23 new "markets" or shopping arcades were built in the Tibet region, bringing the total in the region to 99. The largest of these, the Tromzikang in the Tibetan quarter of Lhasa, houses 1,400 individual businesses, according to *Tibet Daily* (4th February 1994).

The actual history of the development of Tibet was described by Loga, then the mayor of Lhasa, in an article in the Tibetan language version of *China's Tibet* in its Spring issue of 1991.

> *Before 1959, the total area of Lhasa was only about 3 square kms. During the next thirty years, as a result of town planning and development, the total area grew and now stands at about 40 square kms. In particular, from 1980 onwards the pace of development intensified and the town area increased at the rate of two square kms per year. If we look back on the development of Lhasa during the past thirty years, we can notice four main peaks.*
>
> *In 1965 the first market street, the present Yuthok market street, was built along with the Chakpori natural water plant [? rang 'bab-chu'i bzo-dra].*
>
> *In 1976 many market streets were built and the present structure of the town took shape. At about the same time, in the west of the town electric power plants were also built.*
>
> *Between 1984 and 1985 the State Council approved the master plan for the development of Lhasa which served as a basis for developmental planning. Of the 43 cement factories in TAR, 18 were located in Lhasa which, when begun, set the construction projects going at a hectic pace. As a result, many new factories sprang up around the Potala one after the other. Modern and wide avenues with canopies of trees on either side and islands of colourful gardens en route were built on the north of the Kyichu river. This has further enhanced the beauty of the ancient town of Lhasa.*
>
> *The years between 1987 and 1991 witnessed the fourth peak of development. It comprised mainly the renovation of the old parts of the town and secondly a new township "combining the principles of modern town planning with traditional architectural grace" was developed around Lhasa.*

Demolition of Traditional Buildings

Although the Lhasa Municipal plans are ambiguous in many respects, they do appear to propose the demolition of all existing buildings in the Old Quarter by the year 2000, with the exception of a few famous sites such as the Jokhang and Ramoche Temples, which have been designated as cultural relics or as of importance for tourism. The demolition plan has not been enunciated specifically by officials, but is implicit in the plans and has never been denied by the Chinese authorities.

The plans consist of 10-maps or diagrams, of which the first shows Lhasa as it was in 1980. In this the Old Quarter of Lhasa - the Barkor area which surrounds the Jokhang Temple - and Shol, the area at the foot of the Potala Palace, are marked by cross-hatching designating them as old areas. In Map No.2, which shows the plans for Lhasa by the year 2000, the cross-hatching has disappeared, suggesting that the areas are destined for demolition.

In an article published on 24th March 1994 the official paper *China Daily* announced the existence of a plan to construct the "new Potala Palace Square", apparently on the site of the village of Shol, from where most of the Tibetan residents had already been evicted. In the Old Quarter of Lhasa demolitions have continued in a piecemeal rate with several dozen being demolished each year, so that fewer than one third of the traditional Tibetan homes which were intact in 1959 are thought to be still standing. Demolitions were still continuing in the autumn of 1994.

The authorities justify the demolitions on a number of bases. They argue that there is a pressing need for residential space, certainly the case as the population of Lhasa expands, but an inadequate explanation for the number of offices and commercial premises that have been rebuilt on former residential sites. The introduction to the official plans says that a major reason for demolishing the traditional houses in the Old Quarter is to facilitate the improvement of infrastructure services, such as the provision of power, roads and drainage to the quarter. The plans state that

> *Secondary [steps in order to achieve the aim of "transforming the old municipal area"] are the provision of water supply to the city centre; then sewerage arrangements; provisions in the commercial, service, cultural and health sectors; provision of urban roads.*

The results of both the 1990 and the 1993 surveys reveal no improvement in sanitation, water supply or electrical service resulting from the reconstruction of Lhasa. In fact, the reverse has been found.

The demolition of traditional secular buildings is sometimes justified by the deteriorating condition of the old buildings, which had apparently not been repaired or maintained since they were appropriated by the Chinese government in the late 1950. "Most residential houses in the old part of Lhasa, built with mud and wood, were on the verge of collapse," Mayor Loga told *China's Tibet*, speaking of the care with which "renovation and rehabilitation" had been carried out. In fact both these terms are used by the authorities to describe demolition and the construction of new buildings rather than renovation; apart from the major temples no buildings have been renovated in the normal sense of the term. "After four years of demolition and reconstruction up till last year, the State Council has successfully rehabilitated over 2000 families. The people in general have welcomed this," the Mayor continued, clarifying that demolition is a form of rehabilitation. However, during the survey it became clear that in the few cases which could be checked some of the traditional Tibetan houses that were being demolished were structurally sound as well as of great aesthetic and historic significance. A complete survey was not possible, but it is evident that from a construction or safety point of view there was no need to demolish all these houses.

Tibetan Views

No systematic survey of Tibetan views has been conducted. However, local Tibetans who were interviewed expressed dissatisfaction at having to pay higher rents for inferior, crowded, less comfortable housing. Objections to the new housing arrangements also included unwelcome changes in eating and sleeping habits resulting from lack of space and facilities; the effect on household religious practices when there is no space for an altar room in the new, smaller apartments; and lack of space for outdoor work or activities because the courtyards are smaller and more densely populated.

Many Tibetans are reported to have been strongly in favour of modern housing with better amenities. Others are reported to have complained that life in the new units was less comfortable than in old houses and was more likely to lead to illness, apparently because the concrete-box construction method makes the new units hard to heat and gives very low insulation, thus contributing to an increase in respiratory illness, especially during the winter.

It was also noted that relocation from small compounds to larger apartment blocks tends to break up extended families and other long-standing forms of social association. Some Tibetans felt that this was part of a conscious effort to disrupt communal associations amongst Tibetans, and it is likely that, whether deliberate or not, the evictions will have this effect. Tibetans also continued to say, as they had in the 1990 survey, that the new building developments will allow the authorities to increase the network of police informers, since officials will decide who lives where and residences will house greater numbers of people. The concerns reflect the pervasive character of the security services in Tibet and China, who operate by deploying informers in large numbers: the Lhasa police are said to maintain a network of 600 informers in the Old Quarter, according to some reports, besides other agencies who also place paid informers in local communities.

Allegations of corruption and bribery by Tibetans seeking to persuade re-allocation officials to rehouse them in one or other part of the Old Quarter have also arisen. Similar reports were received in 1990 but in 1993 the scale and size of bribes is said to be higher. A minimum bribe of 5,000 yuan is reportedly needed to ensure allocation of a `first class' apartment (ie., an apartment with shop space attached or with a particularly good location). Bribes of up to 10,000 yuan were reported for the most desirable apartments and locations. To secure a well located `second class' apartment or one with better than average facilities, bribes of 2000 to 3,000 yuan were said to be standard in 1993, according to some sources.

Tibetans interviewed also consistently objected to the replacement of residential by commercial buildings in the Old Quarter. Some people said that there is already too much shop space in the Old Quarter and complained that the commercialisation of the neighbourhood is bringing in large numbers of Chinese and Hui Muslim business people, many of whom are taking up residence in the Old Quarter.

PRINCIPAL CHANGES SINCE 1990 TIN SURVEY

In 1990 a western researcher with expertise in construction industry made a survey for TIN of construction in the Old Quarter of Lhasa. At that time the survey showed that 26 large new buildings were being erected, and established that services and facilities in the new buildings were not an improvement on those available by the traditional buildings which had been demolished to make way for the new constructions.

A second survey was carried out by a researcher in 1993. This survey found 67 active building sites under construction in the Old Quarter or on those streets forming its immediate perimeter. These construction projects consisted of:

- **13 public housing units**
- **9 housing for `work-units'** (one group of apartments is attached to a government built shopping arcade, making classification difficult)
- **6 high-quality, `privileged' housing units**
- **17 structures providing office or retail space**, some with residential space attached. Most are built by government or work-units
- **19 privately-built by Tibetan owners**, one of which is a private hotel
- **1 Buddhist temple**
- **2 large demolition sites** with insufficient construction to identify their purpose.

The earlier TIN study carried out in 1990 found 26 building sites in the same area, of which nine were large public housing units. None of those appeared to have been built by private individuals or organisations, other than three which were quarters for monks.

By estimating the number of people expected to occupy each apartment, the survey team arrived at a figure for the total number of persons who would be rehoused by the 1993 constructions in the Old Quarter. This was estimated to be 2,275 people in 603 apartments on the 40 residential sites. Of these we anticipate that 1,400 people will be housed in the 363 apartments contained within the 13 new public housing buildings constructed in 1993. This means that two thirds of the people who will receive accommodation from the new buildings will live in one quarter of the sites that have been constructed.

This can be compared with the 1990 TIN Survey, which identified 374 apartments which were constructed in 1990 to house a minimum of 1,430 people in 24 out of the 26 buildings construction at that time, with fewer apartments in each building and a much greater percentage of public accommodation in the overall construction wave than in 1993. Thus the provision of public accommodation in the Old Quarter in 1993 was almost identical to the provision of the same level of accommodation in 1990, although construction activity and investment was far greater during the later period, with two and half times as many new buildings being put up.

Increased Non-Residential Building

Since 1990 there has been a significant increase in the construction of non-residential buildings: only two of the 1990 constructions in the Old Quarter were being built completely for commercial or retail purposes. 17 non-residential sites were observed in 1993, mostly intended for use as offices. Three of these, were large shopping arcades built on the Barkor street itself. These arcades, along with the other new commercial buildings, have been built on sites formerly occupied by Tibetan homes and shops, which almost exclusively served local needs.

All three of the arcades have been built as luxury or high-class shop space. They are in effect priced out of the range of most local merchants, so that a substantial portion of such retail space is likely to end up being run by non-Tibetan operators. Goods in the new shops are expensive, and are likely to be beyond the means of most local residents.

Appearance of Privately-Built Tibetan Housing

A new development since 1990 is the emergence of private, Tibetan owned construction projects. In 1993, 19 buildings were constructed privately by Tibetans. Many are private homes. A number are three-storey units which consist of a residential apartment for the owner's family on the top floor, plus units to be rented out on the lower two floors.

These buildings appear to be superior to public housing in overall quality and comfort and are consistent in design with the original character of the neighbourhood. Most were built by predominantly Tibetan labour.

Anecdotal evidence suggests that, as in most areas involving government officials, Tibetans wishing to initiate such projects have to use bribes and good connections within local government to get the necessary permissions for construction.

Infrastructure Facilities

The 1993 survey found that the overall standards of the water, sewerage and electrical services provided in newly built public housing have declined compared to similar projects built three or four years earlier. This appears to contradict Government claims that Tibetan neighbourhoods are being demolished primarily to upgrade services and to improve safety, comfort and hygiene for residents. However, there was an observable improvement in the quality of construction and facilities in the two categories of `privileged housing' and work-unit housing.

City housing authorities are mandated by higher government departments to produce a certain quota of new public dwellings at a fixed cost. Local, unofficial Tibetan sources report that about 250 yuan per square metre, exclusive of property costs, was spent on construction of public housing in 1993. Similar sources report higher quality, privately-built Tibetan housing averaged three to four times that. Work-unit and `privileged' housing are even more expensive to build. To keep within the stipulated budget and to meet construction quotas, there is an inevitable reduction in quality, hygiene, safety and comfort in the construction of public housing.

SURVEY DETAILS

Types of Construction and Definitions

Construction in the core Tibetan areas can be divided into seven main types. Four of the types are intended primarily for residential use:

- **public housing**
- **work-unit housing**
- **`privileged' housing**
- **privately-built Tibetan housing**, including some shops and a hotel

Three other recognisable types are intended primarily for non-residential use:

- **retail facilities**
- **small government offices**
- **large multi-use government compounds**.

Two principal traditions of design have been followed in the construction projects in this area of Lhasa, for which we have used the terms `Tibetan Methods' and `Chinese Methods'. A hybrid construction style, with characteristics which we have described as `Tibetan cosmetic touches', is also prevalent. These terms, as they apply to construction in Lhasa, can be summed up as follows:

Tibetan Methods and Materials: Low ceilings, small windows, double-ply walls on exterior with an internal cavity filled largely with rubble and earth (between 1.5 and 2 times as thick as Chinese style walls), slabs with high earth content supported by wooden beams and dowels all contribute to high thermal efficiency and structural flexibility. Usually two storeys high.

Chinese Methods and Materials: Extensive use of pre-cast concrete slabs averaging 0.6m x 2m; walls formed of single layer of stone blocks; walls stabilised by concrete bond beams at slab levels; slabs composed of pre-cast slabs with 5 to 8 cms (2-3 inches) of unreinforced concrete topping; large windows in most rooms; little or no use of wood; buildings usually 3 and sometimes 4 storeys high.

Tibetan Cosmetic Touches: Exterior walls whitewashed with black borders painted around windows; lintels above doorways and windows made either of wood in traditional Tibetan style or of concrete blocks in simulated Tibetan style; lintels above doorways and windows painted in crude but traditional Tibetan floral motifs; interior exposed beams painted with floral motif. These additions appear to represent what is referred to in the municipal planning documents as "nationality characteristics".

Townhouses - Many of the traditional buildings in Tibetan towns were three or four sided blocks constructed around a central courtyard, typically two storeys with three to four living rooms on each floor. Another arrangement appearing in the current development of the Old Quarter is one which we have called the "townhouse" style. This is the equivalent of the British term "terraced houses", where each house has a small back yard or front yard, with its side walls joining neighbouring houses. Buildings in the townhouse style nearly always have two floors (ground floor plus one), an interior stairway, a small balcony (usually 2m x 4m) on the upper floor, and sometimes a flat roof area that can be used as a private roof terrace.

Much of the recent construction in areas of Lhasa outside the Old Quarter draws on very much more modernist styles of architecture imported from current Chinese East-Coast development fashions, showing a strong preference for the use of glass, chrome and geometrical designs. This style is not prominent in the Old Quarter of Lhasa.

Residential:

By adding together the estimated capacity of each of the known housing projects the survey team estimated that approximately 2,300 people were due to receive new housing in the Old Quarter of Lhasa in 1993.

Public Housing

(Figure 1: Nos.11-16, 25, 30-31, 34, 38, 50-51)

Thirteen of the sites studied in 1993 are public housing apartment complexes with a total of 363 apartments. They averaged 28 apartments per block. The survey team estimates that each block will house 107 people. Based on this it is expected that these units will provide housing to about 1,400 people, or 62% of the estimated 2,300 people due to receive new housing in the Old Quarter in 1993.

Those housed in public housing are usually unaffiliated to work-units or government offices, or else are employees of such units or offices but are not provided housing as part of their employment compensation. It is common for Chinese employees of units to receive housing within unit compounds because of their `non-resident' status, while a proportion of local Tibetans in similar work units are expected to make their own housing arrangements.

Public housing was generally found to be of low quality, meeting only the most rudimentary needs of occupants (for details see **Infrastructure Facilities**).

Public housing apartments in the area are usually at least three storeys tall; construction of buildings above three storeys in height in the Old Quarter is controversial, since higher buildings would dominate the Jokhang Temple. After late 1992 some four storey blocks were built.

In most cases the public housing apartments have small interior courtyards which are shared by all residents. These structures are generally built on the sites of two or more smaller residential compounds, both of which were usually two-storey homes around a courtyard. As a result, the present pattern of public housing construction creates an increase in population density and, by lessening the available space for communal activity, it leads to a sharp drop in space available for outside activity or recreation.

In keeping with the dictates of planning policies, which demand convergence with the architectural style of the Jokhang Temple, regarded by the authorities as an important "cultural relic", public housing in the Old Quarter usually includes cosmetic Tibetan style decoration (see **Definitions**). No traditional Tibetan methods or materials are used in public housing other than superficial cosmetic touches. Most skilled labour on these projects is Chinese; most unskilled labour is Tibetan.

Work-unit Housing

(Figure 1: Nos.9, 18, 21-22, 27-28, 39, 43, 53)

Most work-units provide housing for at least a portion of their employees. This housing is generally superior to public housing and is sought after in Tibet, as it is throughout China.

Nine blocks of work-unit housing were constructed within the Old Quarter of Lhasa in 1993. All were built within the compounds of existing work-units, either replacing older structures, often tin-roofed relics of the Cultural Revolution, or filling unused space.

The nine blocks averaged about 12 apartments, or 38 persons per block, less than half the average of public housing. They will house approximately 345 people in total who, it is estimated, will represent about 15% of those being rehoused in the Old Quarter in 1993.

Most of the units observed had completely Chinese building crews. Skilled labour is invariably Chinese in work-unit construction, according to our observations.

Privileged Housing

(Figure 1: Nos.4-8, 19)

Government officials or work-unit officials, and occasionally those persons with exceptional *guanxi* (connections), are able to obtain residence in what we have described as `privileged housing'. Six such installations were found in the `Old Quarter' in 1993. Buildings of this relatively luxurious kind have been built recently in larger numbers in the suburbs of the city where more space is available for private courtyards or gardens.

Of the six projects of this type under construction in the Old Quarter in 1993, all but two were in a very early stage of construction, making definitive statements about amenities difficult. It is estimated that they will provide a total of 33 homes for around 190 people, or 8% of the people catered for in the new housing provision. There are usually only six or eight homes per block, far fewer than in any other arrangement. The usual layout for such homes is townhouse style (see **Definitions** above).

The overall quality of privileged housing is significantly higher than that of public housing or work-unit apartments. The apartments in these `privileged' buildings are spacious, typically providing about triple the space of a public apartment: usually four full-sized rooms, three half-sized rooms and a private balcony the size of half a room. Privileged housing is often built with private courtyards and private rooftop access. A detached cottage which can be used for storage or for domestic help is sometimes provided. No Tibetan skilled labour could be found constructing any privileged housing.

Private Housing

(Figure 1: Nos.1-2, 10, 17, 23-24, 26, 29, 32-33, 37, 41-42, 44, 46-47, 54-55, 67)

The most diverse group of sites are privately-built homes or multi-purpose facilities constructed by Tibetan owners. The 1990 TIN survey found no rental or residential property being built by lay Tibetan owners. In 1993, 19 such sites were identified within the Old Quarter.

The buildings vary considerably in size, function and construction. One of the sites is a private hotel. The others are either residential or a mix of living and shop space. These 18 sites include about 100 apartments or residences which will house about 350 persons without overcrowding, or about 15% of those estimated to be receiving new housing in 1993.

The largest private construction project in 1993 was a private hotel on Ramoche Road. The smallest was a modest traditional Tibet style house.

While some private projects used Chinese methods and materials or a mixture of Chinese and Tibetan methods, several private projects were using largely Tibetan methods. In these cases Tibetan style decorations are used extensively. Some are extended-family compounds, the traditional unit of housing in Lhasa for centuries. None of these projects occupy the space of more than one previous building, and so maintain the general layout of the neighbourhood and its existing population density.

Extended-family compounds are most commonly two-storeys high. Only homes of the highest ranking nobility were sometimes built three storeys high.

Some private complexes have been built in a style which reflects the Indian or Nepali business background of the owners. These are three-storey structures with the top floor wholly dedicated to a spacious suite of rooms for the owner's family. Lower floors are rental apartments.

Most private projects used Tibetan labour for both skilled and unskilled work.

Retail/Commercial Facilities

(Figure 1: Nos.3, 27, 35-36)

Of the four projects within the Old Quarter designed wholly for use as shops, three are large, indoor arcades on the Barkor itself. All are said to be government-built. All have minimal Tibetan cosmetic touches visible from the street but interiors are modern Chinese in style.

The largest (No.36 in Figure 1), at the southeast corner of the Barkor, has an estimated 50,000 square feet (4,647 square metres) of floor space. Two of Lhasa's historic homes, belonging to the Tsarong and Surkhang families, were sold to the government by the owners to provide the space for this new building, allegedly after pressure was brought to bear on the owners by officials.

In 1990 one building designed purely for use as a shopping arcade was built within the Old Quarter, on the site of the former Tromzikhang market area. Many spaces in this building are currently occupied by Chinese immigrant traders.

Water and electrical amenities available in these complexes are usually better than those to be found in surrounding residential compounds, and the new shopping arcades are brightly lit.

Skilled labour was completely Chinese on all these non-residential projects. Tibetans had a share of unskilled labour.

Government Non-residential buildings

(Figure 1: Nos.20, 40, 49)

There are three Government non-residential facilities within the Tibetan Old Quarter. The most significant of these is a large, modern office building (No.20) being built for the Lhasa City Government. The others are an *Uyon Lhenkhang* ([neighbourhood] committee) ection of the Barkor and a medical clinic near the south Barkor. Skilled labour was exclusively Chinese, while Tibetans performed some unskilled labour.

Government-Built, Large-Scale Office / Retail Facilities

(Figure 1: Nos.57-66)

All of these sites are situated on the main streets that form the boundary of the Old Quarter. All are large, modern structures reaching up to five storeys. Some are government institutions, such as a major new Bank of China compound. Several of the compounds also contain living quarters of the `privileged' type at the back of the main building to accommodate unit employees. Others are long strips of shops adjoining large work-unit compounds. The majority of such retail space also provides accommodation for Chinese traders, who often live in their shops. Some of these are two-storey structures (Nos. 62, 63, 65).

INFRASTRUCTURE FACILITIES

Electricity Supply

At the time of the 1990 survey only one public housing apartment under construction had the main switches installed. This made it impossible to draw any definite conclusions about the electrical power supply being supplied to new public housing units at that time. In 1993 data on electrical supply was gathered on three public and two private projects.

Average supply per apartment in public housing where utilities were connected was 0.19kw (190 watts) per apartment, or slightly less than 1 amp at the safe capacity of the main switch. This would make electric cooking or heating impossible (electric cookers require at least 10 amps each). Electrical wiring was poorly installed, always unshielded and always surface-mounted, creating potential hazards to residents.

The average for private Tibetan projects, also judged by the capacity of the main switch, was 0.36kw, or 360 watts. While nearly double that provided to public apartments, it is still far below the average of 20 to 30kw that privileged apartments receive. 30kw is sufficient for cooking and heating simultaneously.

Work-unit housing is difficult to study since the supply service often originates in another part of the compound or from a fuse box which serves workshops as well as living spaces. In cases where some determination could be made, it appeared that work-unit apartments may be receiving between 1 and 5kw or 1,000 to 5,000 watts in some cases, enough for electrical cooking or heating. Wiring in these units was frequently installed within the walls, increasing durability and safety.

Public housing projects built between 1990 and 1992 often had individual electric meters and fused switches above apartment doors. These were not part of the original electrical installations, but were installed later to enable housing authorities to bill residents for extra electricity consumed in excess of a small quota, according to local sources.

The quality of electrical equipment available in Lhasa was found to be poor: out of five 10-amp switches bought from an electrical supply shop in Lhasa only one was found to be not faulty.

There are plans by the Chinese authorities to improve the electricity supply in Lhasa, but the facilities provided in public housing would not be able to take any advantage of an increase in the power supply.

Water Supply

Public housing projects built in 1990 had one water tap per floor, shared by an average of seven or eight families. Eight out of the nine public housing projects built then had a single water tap on each floor, although at that time the survey team noted that the size of the tap (usually 13mm (1/2 inch)) was likely to restrict normal water supply. Fittings were of low quality and were unlikely to survive rigourous use.

The public housing projects built in 1993 have only one tap per building, generally located outside in a central courtyard. It was possible to study the provision of water services in 12 of the 13 public housing sites, and none of them had water supplied on each floor. In all 12 buildings water is supplied by an open-air courtyard tap. Only one of the 12 units had more than one tap. It is estimated that the average number of people sharing one tap will be 87, over double the 1990 average of 41. In some cases a single tap will be shared by over 100 people.

Water facilities in private housing vary widely but are still better than in public housing. Some private houses have sinks and showers in each apartment, but others have only basic facilities, sometimes depending on shared access to the courtyard tap. Where this is the case, there are estimated to be no more than 20 people sharing the source.

All units in `privileged' type housing built in 1993 had sinks with running water installed in each apartment.

In some cases the water is now provided by electric pumps, replacing hand pumps, but during power cuts, which are frequent in Lhasa and may occur for several hours each day, the pumps do not work.

Drainage Facilities

Drainage standards in public housing appear to have declined since the 1990 TIN survey. Generally drains are installed only at water supply points and sometimes at one or two storm drains in courtyards. The reduction in water supply points means that drainage facilities have also been reduced as well.

Drain lines do not exceed 10 cms (4 inches) in diameter and most are only 5 cms (2 inches). This would typically be found in a single family dwelling in western countries, but is insufficient for a block of apartments. In no case was there any sign of interior drainage provided in public housing.

Drainage systems installed over the last few years have become serious health hazards in the old neighbourhoods. Manhole covers and septic pit covers are often broken or missing. Drainage lines are often blocked, causing effluent to flow freely into pedestrian areas, into market places and along streets.

As was the case in 1990, there are no separate systems for storm drainage, sanitary sewerage and waste sewerage.

Sewage Disposal

Toilet facilities differ between government-sponsored construction, including public housing units, and private housing. All public housing and most work-unit housing use Chinese-style toilets. The 1990 TIN survey describes them:

> *Each floor of each building, excepting townhouses, has been equipped with Chinese-style toilets. Wastes are compelled by gravity to proceed through a square hole in the floor. From there they travel along a short chute and into a wall cavity where they drop to ground level. There they eventually move through a hole in the exterior wall and into a pit beneath the street or alley. The pit is usually covered by concrete panels which must occasionally be moved aside to muck out the pit.*
>
> *The toilets do not flush and are operationally the same as those demolished. There are more toilets per unit than before, but the new facilities are otherwise similar to those to be found in older buildings....*

In 1993, the ten public housing units with completed toilet facilities required each toilet slot to be shared by an average of seven people. This is a slight improvement over 1990, when the average was eight. The public housing average is similar to that of work-unit housing, even though work-units have markedly better water and electric facilities.

For the 12 private housing projects where toilets could be examined, only two had Chinese-style toilets. Eight had Tibetan-style toilets, and two had the modern flush variety. All privileged housing units built in 1993 have private flush toilets.

The 1990 survey describes the difference between Chinese and Tibetan styles:

> *The most significant difference between the two is where the waste accumulates. In older Tibetan homes the collection chamber was at ground level, accessed through small vertical doors which allowed cleaning. These were liable to be ill-smelling. They are, however, much easier and speedier to clean than the new, below ground design. When wood was the main kitchen fuel, ashes were deposited in the toilets, hastening drying of the wastes and providing a natural deodorant. Ashes are no longer available.*
>
> *The Chinese toilet places the accumulation pit underground. Cleaning is slower, more difficult and less likely to be done. The pit has access from above, so must be in an alley, street or sidewalk. Panels covering the pit often break or are shifted by passing vehicles, creating serious and unpleasant hazards for unwary pedestrians and cyclists. Since water also accumulates in the pits, the wastes never dry. In the rainy season they often overflow creating a health hazard even worse than the Tibetan model. Like the Tibetan toilets, they are completely unsuited for conversion to a flush system.*
>
> *As more Chinese toilets are built in the Old Quarter, the issue of their cleaning becomes more critical. Pump trucks are often unable to manoeuvre in the Barkor's narrow, congested allies. The alternative is to empty the pits using a bucket and shovel, a task which is sometimes performed by prison labour teams. More often, it seems, the task goes undone and accumulated waste spills into alleyways.*

Public Housing Structure

For the 1990 TIN survey, detailed floor plans were compiled for every site under study. The physical layout of apartments has not changed since that time and it was therefore unnecessary to repeat this exercise

The following description from the 1990 survey holds true for 1993 construction:

> *Apartments are based on a module approximately 4m x 4m. This varies very little, plus or minus 20cm, from unit to unit and compound to compound. Most apartments contain a half-room (nominally 2m x 4m) which usually serves as a kitchen and perhaps a sleeping room for one. Thus, most apartments are 1.5, 2.0 or 2.5 rooms. In some cases an apartment has 2 or 3 full-size rooms and no fractional rooms. In other cases, a 0.75 room (2m x 6m) is used. In all cases, room totals can*

> *be expressed as a sum based on the 4 x 4 module...*
>
> *The average per apartment is 1.8 rooms, or about 28 square metres. That nominal figure yields about 3.8 persons per apartment and about 7.6 square metres per person. Based on 3.8 persons per apartment ... it is expected that two persons will live in each room.* (TIN Housing Supplement, 1990, p 3)

This is consistent with a report issued by *Xinhua* in December 1993 (SWB 2nd December 1993; FE/1861/G1) in which the Construction Ministry reported a national goal of eight square metres per person by the year 2000. Since Tibetan cities are not as crowded as those in China, homes have always been more spacious. New apartments are smaller and are apparently consistent with national planning criteria. However, Tibetan families do not always comply with Chinese standards for optimum family size, achieved through birth control policies, and so the presumed average occupancy of 3.8 persons per apartment may be low.

The description of structural techniques is provided in the TIN 1990 survey. These details remain unchanged:

> *Foundations average between 1 and 1.5 metres in depth and are of stone blocks mortared together. Mortaring is reported to have been haphazard, and improperly compacted fill was left under foundation work on some occasions. Foundation work was noted to proceed very rapidly, with minimal attention to quality and considerable attention to getting it covered quickly, according to observers.*
>
> *Exterior walls are of stone blocks with mortar joints; interior walls are some what thinner and made of solid concrete blocks with mortar joints. Small concrete columns are spaced at approximately 4 metres along one building axis and 2 metres along the perpendicular axis. Beams are poured across these walls and columns at slab levels, forming a grid nominally 4m x 2m. The only exposed beams are those bisecting the ceilings of 4m x 4m rooms and those supporting outer edges of balconies.*
>
> *Although the design seems adequate, workmanship is poor; most of the beams are better regarded as bond beams than truly structural. Exposed reinforcement bars and severe `honeycomb' [pockets of air remaining in concrete which virtually eliminate the structural strength of the affected area] are rampant and plasters are said to be busy repairing these.*
>
> *Cold, unformed joints in beams are common (except directly over doors and windows). Concrete is site-mixed in power machinery, and is often transported within formwork by excessive use of electric vibrators...*

Walls are composed of plaster over solid concrete or stone blocks. Floors are concrete. Upper slabs are a composite of about 5cm of concrete topping over precast concrete slabs averaging 10cm in thickness, 2.25m in length and 0.5m in width. Ceilings are simply the bottom side of the slabs, with the gaps plastered.

The standard of fabrication and installation of precast slabs appears to have declined noticeably since 1990. According to observers reinforcement wire is of light gauge, similar to that which might be used in an ordinary sidewalk in the West. There is frequently no pre- or post-stressing. When the freshly compacted slab sections are dumped from formwork on a waist-high, rotating work table onto the ground to set, there is often considerable shock to the fresh concrete. Cracks appearing in the slab were seen being touched up with a trowel while still wet, thus hiding the defect but not correcting it. Slabs were also seen to be placed directly onto a levelled section of ground for curing. Because that surface is shaped by hand with a shovel and levelled by sight only, these slabs are unlikely to be flat.

Slabs placed between supporting beams often appeared badly seated. In some cases they were not properly grouted into position or anchored. The compilers of this survey reported seeing many examples of slabs overlapping beams by as little as 5 cms (two inches), about half the distance required for safety. Precast sections are then covered by a cement-poor concrete mixture with no reinforcing. Such fault placement can occur at a third or fourth storey (i.e., roof) level. Slight or moderate earth tremors, which are not unusual in Tibet, could easily cause precast sections to slip from supporting beams or walls where the overlap is insufficient.

Older Tibetan homes had thick walls, usually sloping inward and upward, with a high earth content. Wooden beams were substantial and rarely exceeded 4 metres in length. The entire structure was flexible and so able to absorb shock. Windows were small and did not seriously compromise the strength of walls.

Housing Expropriation, Re-allocation and Rent

Expropriation

As was the case in 1990, observers found little evidence that municipal authorities provided compensation for displacement or assistance in locating temporary housing.

The general practice is for residents to be informed by *Uyon Lhenkhang* (Neighbourhood Committee) officials that their buildings are to be demolished. Tibetans interviewed said that legal processes of serving written notification that premises should be vacated or informing residents of any right of appeal do not exist. There are also reports that any resistance can result in an unfavourable home assignment or possibly lead to replacement accommodation being withheld, although no specific examples of locals refusing to vacate and being penalised as a result were found.

The length of time given to residents as notice to vacate premises is reported to vary in length. Generally, residents have a few weeks notice before demolition begins. Some Tibetans claim that in some cases residents have been evicted with only a few days' notice. Displaced residents may have to rely on friends or family to provide temporary accommodation and it is reportedly not uncommon for families to set up housekeeping in tents on the outskirts of the city, or in the courtyards of friends' houses. Some families are forced to give up residence in Lhasa altogether if they cannot find temporary accommodation or if they cannot afford increases in rent.

In cases where compensation is known to have been paid the sums have been low. For example, one of the expropriated homes demolished to make way for the large shopping arcade constructed on the southeast corner of the Barkor is reported to have been sold to the government for 750,000 yuan by its owners. Local Tibetans report that the land itself was actually worth considerably more than that.

In some cases evicted families have been given the opportunity to buy property in the suburbs of Lhasa, where land values are on average one tenth of those in the Barkor.

Re-allocation of Housing

Residents of demolished homes are supposed to be re-allocated accommodation in the new buildings after construction has been completed, according to some Tibetans. It was not possible to establish in this survey whether this provision is implemented. But, as was the case in 1990, some Tibetans claimed that the authorities had refused to re-allocate housing to families who had been involved in some form of political protest. Tibetans who receive a court sentence (rather than an administrative sentence) for demonstrating, pamphleteering, or other non-violent expressions against the Chinese system, receive an additional sentence of `deprivation of political rights' which is served after the prison sentence has been completed. Some Tibetans in Lhasa report that some individuals have been deprived of housing as part of that loss of `political rights'.

Rent

Rents have increased in Lhasa's new public housing projects in keeping with policy throughout the PRC. Rent is calculated by space, class and location within the Old Quarter. A "pillar" remains the colloquial Tibetan unit of interior space. It was traditionally about 20 square metres, although today it is closer to 16 square metres, which coincides with the standard modular room of 4m x 4m built in new public housing.

Local sources report that a 1.5 pillar apartment (24 square metres) is allocated for one to three residents. This is in keeping with China's stated goal of supplying each resident with 8 square metres of space (see *Xinhua*, cited in SWB 2nd December 1994, FE/1861/G1) and with the TIN survey findings of an average of 7.6 square metres per person. For families of three to five persons, a two-pillar apartment is allocated. The average size of public apartments is about 28 square metres, midway between 1.5 and 2 pillars. The largest public-housing apartments are about 56 square metres, about 3.5 pillars, but these are very scarce.

Locals report according to new rates, first-class apartments are rented out at 10 yuan per square metre per year. A first-class apartment, which usually includes shop space, could cost from 240 to 400 yuan annually for the most common sizes. Second-class apartments are rented for 1 yuan per square metre per year. Based on this a new second-class apartment, by far the most common category, would cost between 16 and 40 yuan per year for the most common sizes.

These rents are extremely low by non-Chinese standards but are higher than those reported by Chinese authorities as national targets. Li Tieying, State Councillor and head of the State Council's leading group for the reform of the housing system, stated that average rents have been adjusted to a range from 0.3 yuan to 0.5 yuan per square metre per year (see *Xinhua*, cited in SWB, see above).

The reason Tibetan rents are higher is unclear. It may be partially due to the higher costs incurred by importing many materials from China as well as much of the labour. Chinese building labourers report that wages in Lhasa are often double those in their home provinces.

LIST OF NEW STRUCTURES

(Note: the numbers for each site refer to the numbers in Figure 1.)

1. Private Tibetan hotel - Local Tibetan owner; located on Upper Ramoche Road. Indian-influenced design for guest amenities in `luxury' portion of hotel. Two sections of hotel: (a) `luxury' area built largely by Chinese labour good plumbing and electrical services, large comfortable rooms, restaurant with large kitchen area; and (b) `economy' area built by Tibetan labour; very basic plumbing/electrical service, small rooms.

2. Private Tibetan residence with shop space - Upper Ramoche road; completed before survey; detailed inspection impractical. Adjacent to private hotel above.

3. Strip of small retail shops - Ramoche Road near Ramoche Temple, 23 shops, approx. 12' x 12'(3.6m x 3.6m); low-quality, temporary construction on edge of large compound behind; skilled labour Chinese.

4. Government-built townhouses - Tsemonling area; very early stage of construction late 1993; only foundation work under way; part of large complex of relatively luxurious `townhouses'; privileged housing; skilled labour mixed, unskilled Tibetan.

5. Government-built townhouses - Tsemonling area; very early stage of construction late 1993; only foundation work under way; part of large complex of relatively luxurious `townhouses'; privileged housing; skilled labour mixed, unskilled Tibetan.

6. Government-built townhouses - Tsemonling area; very early stage of construction late 1993; only foundations under way; part of large complex of relatively luxurious `town-houses'; privileged housing; skilled labour mixed, unskilled Tibetan.

7. Government-built townhouses - Tsemonling area; comfortable, privileged housing; part of large complex of relatively luxurious `townhouses'; each home has private, gated entrance, private courtyard (approx. 8' x 25' (2.4m x 7.6m)) with detached 7' x 14' (2.1m x 4.2m) building usable for accommodation or storage; private bathroom in each courtyard with sink and flush toilet; basin with tap in each courtyard; each home has four rooms 12' x 12'(3.6m x 3.6m), three rooms 6' x 12' (1.8m x 3.6m) and a 6' x 12' private balcony; electrical wiring surface mounted; individual fuse box for each home (final installation not seen, exact service unknown; similar units have about 30 amps); skilled labour mixed, unskilled Tibetan.

8. Government-built townhouses - Tsemonling area; early stage of construction late 1993; ground floor partially complete; too early to determine if each unit would have all the amenities of No.7; privileged housing; skilled labour mixed, unskilled Tibetan.

9. Work-unit apartments and workshops - North of Tsemonling Temple, behind Ramoche Temple; modern style, no Tibetan cosmetics; one building in a work-unit compound; lower floor comprised of six workshops with roll-down shutters; upper floor six small apartments each with inside sink; all electrical wiring in the wall; all labour Chinese.

10. Private Tibetan residence - Tsemonling area; an unusual, small, private residential compound with seven small apartments arranged around small courtyard; construction materials and methods all Chinese but *décor* all labour, including decoration, by Chinese. Unable to determine nationality of occupants.

11. Public housing - Construction in early stages as of late 1993 so too early to tell final lay out of unit; no toilet facilities or discernible allowance for toilet facilities on first two floors; Chinese methods/materials; skilled labour mixed, unskilled Tibetan.

12. Public housing - Very slow rate of construction; particularly low quality structural work: inadequate overlapping of precast slabs onto beams, poor quality concrete work (inadequate consolidation of freshly placed concrete); Chinese methods/materials; skilled labour mixed, unskilled Tibetan.

13. Public housing - Tsemonling area; first four-storey apartment in area; highest roof in neighbourhood; Chinese materials/methods with Tibetan cosmetics. Building ready for electrical hook-up to city service for weeks but none installed; residents moving into new apartments without electricity. Highest persons/water source ratio of any new public housing seen in 1993: estimated 156 persons for a single source; skilled labour mixed, unskilled Tibetan.

14. Public housing - Ramoche Road; installed electrical service less than 200 watts per apartment; one 10-amp main switch wired to serve all 14 apartments; Chinese methods/materials with Tibetan cosmetics; skilled labour mixed, unskilled Tibetan.

15. Public housing - Ramoche Road; installed electrical service about 200 watts per apartment; one 15-amp main switch wired to serve all 17 apartments; Chinese methods/materials with Tibetan cosmetics; skilled labour mixed, unskilled Tibetan.

16. Public housing - Appears to be built on land controlled by a large work-unit, but housing is certainly large public project (design, access to street make this clear); early stage of construction, so observations incomplete; fourth and final side of complex not yet begun; Tibetans were participating in skilled construction, unusual for public housing; Chinese materials/methods.

17. Private residence - Very small; possibly appended to adjacent Tibetan home; some traditional Tibetan materials/methods; no separate water supply or toilet apparent; all labour Tibetan.

18. Work-unit apartments and workshops - Part of a Tibetan handicrafts production co-op (ground floor shops in use for incense-making, tailoring, furniture making); substantial electrical supply from other unit buildings; modern style, no Tibetan cosmetics; Chinese methods/materials; occupants all Tibetan; skilled labour Chinese, unskilled Tibetan.

19. Government townhouses - High-grade privileged housing within Lhasa City Government compound; two-storey townhouses, modern appearance; Chinese materials/methods; all electrical wiring in the wall; all lighting fixtures have wall switches; power points in every room; early stage of plumbing indicates kitchen, bathroom and a courtyard shed will all have underground supply and drainage; final inspection of fuse box impossible but loose wires suggest supply will be substantial, probably minimum 30 amps. Each unit has a staircase leading to rooftop which is designed as a terrace. Nationality of new residents unknown. Lower floor obscured by 8' (2.4m) wall studded with embedded broken glass; skilled labour Chinese, unskilled Tibetan.

20. Government offices - A major addition to the Lhasa City Government compound; tall and modern; no finish work complete; concrete construction of good quality and careful workmanship; ornate *façade* composed of 14 scalloped sections (no use of Tibetan style apparent in early construction or design); fronts Dekyi Shar Lam (Beijing Dong Lu) opposite Banak Shol Hotel; skilled labour Chinese, unskilled Tibetan.

21. Work-unit apartments and workshops - Kyirey area; part of official work-unit: Shigatse transport company (bus and trucks); floor level has large offices/workshops, some with 380-volt electrical service. Upper levels have eight small apartments each. Inside sink and drain in each unit. All wiring in-wall. Craftsmanship relatively good; all labour mixed.

22. Work-unit apartments and workshops - Kyirey area; part of large work-unit compound; lower floor workshops and offices. Upper floors apartments with inside sink each unit. Electricity supplied from other compound source, but appears adequate. Good-quality wiring installation. All residents Tibetan; all labour Chinese.

23. Private apartments - Early phase of construction; detailed observations not possible. Demolition and reconstruction done a few rooms at a time to allow for longer occupancy by displaced residents and earlier occupancy by new ones. Materials and methods mostly traditional Tibetan; single compound demolished and single compound built; mostly Tibetan labour.

24. Private apartments - Noticeable Indo-Nepali influences. Many materials and methods Chinese, but all labour Tibetan. Quality good; each floor with modern bathroom including sink, hot water, shower. Bath on top floor. Other amenities include a top floor solarium. One older compound replaced by one new compound.

25. Public housing - Progress very slow relative to similar units, final observations not possible; all labour Tibetan, unusual for public housing.

26. Private apartments - Traditional Tibetan materials/methods. Very little concrete, no precast. Toilet Tibetan style: separate from house on raised platform with above-ground access for waste removal. Replaces one previous home with one new home; all Tibetan labour.

27. Government-built arcade with apartments - North Barkor Street; modern, government-built arcade with shops on lower two floors and apartments on upper floor. Built on minimum of two former residential sites near NE corner of Barkor Street. All Chinese labour with minimal Tibetan cosmetic touches apparent on exterior only; completely modern Chinese-style interior. No traditional materials or methods used for construction. Taps on each floor near toilets. Generous electrical supply. Breaker panel fusing: 40 amp x 3, 20 amp x 3, 15 amp x 4, 10 amp x 2. Total 260 amps supplied. Shop space on lower floors has a total of 20 roll-down shutters and could be divided into as many as 20 shops. Current configuration has fewer individual units with total area from 150 square feet (14 square metres) to about 450 square feet (42 square metres). All units have one or two 6' x 12' (1.8m x 3.6m) anterooms which can double as sleeping/living space.

28. Government-built administration and apartments - Northeast corner Barkor Street; this small administrative unit is signposted: *Barkor Drongkhyer Yingten Khang*; completed before any interior inspection possible; upper floors apparently housing for unit employees.

29. Private apartments - Very early stage of construction; all Tibetan labour and mostly traditional Tibetan methods and materials. Demolition being co-ordinated with new construction to minimise amount and duration of displacement for occupants. Replaces one compound.

30. Public housing - Part of large redevelopment at NE Barkor including site Nos. 30-34; typical public housing unit: mock Tibetan style, small courtyard with single common tap for 30 apartments. Electrical service installed: single 30-amp switch yields about 1 amp per apartment. Toilet facilities poor even by public standards, with only two male and two female slots for each ten apartments; mostly Chinese skilled labour, unskilled Tibetan.

31. Public housing - Part of large redevelopment at NE Barkor including site Nos. 30-34; very small courtyard shared by 24 apartments. Single tap in courtyard for all to share. Third floor was completed long before fourth was started, suggesting it may have been an afterthought. No toilets apparent on fourth floor. Structural work on upper floor very poor; mostly Chinese skilled labour, unskilled Tibetan.

32. Private apartments - Part of large redevelopment at NE Barkor including site Nos. 30-34; this project one of two private buildings squeezed onto crowded site. Many traditional Tibetan methods and materials; all Tibetan labour. No bona fide central courtyard (all available space used for residences). Rooftop balcony. One tap on ground floor. Electrical service installed: one 20-amp main for entire building gives about 2 amps (400 watts) per apartment. About double the average public level, but no more than 1/10th that of government-used housing.

33. Private apartments - Part of large redevelopment at NE Barkor including site Nos. 30-34; this project one of two private buildings squeezed onto crowded site. Small but well built. Traditional Tibetan materials and methods used. All Tibetan labour. No courtyard space.

34. Public housing - Main structure of five built on large site at NE corner Barkor, site Nos. 30-34; careful efforts to preserve Tibetan cosmetics on this long building fronting the Barkor, the most touristic walk in Tibet; no traditional Tibetan methods/materials. Some particularly poor structural work evident during installation of precast slabs. All water via two courtyard taps. Virtually no courtyard despite large number of residents. Available open space serves as access path for apartments in this building and site Nos. 30-33; skilled labour mostly Chinese, unskilled Tibetan.

35. Government-built arcade - East Barkor Street; slight Tibetan cosmetics on exterior Chinese-modern style in the interior. One large residential compound demolished to make space for this commercial building. Some upper floor space could be offices and double as residences. All construction, including slabs, reinforced concrete poured in place. Heavy-duty wiring installed throughout. Large chandeliers hung from atrium ceiling. Part of rooftop to be used as teashop/restaurant. All Chinese labour.

36. Government-built arcade - Very large retail shopping arcade at southeast corner Barkor. At least three homes demolished to make way for this construction; principal houses belonged to Surkhang and Tsarong families. Surkhang house was former site of the Barkor English School. Government paid 750,000 RMB for one of the houses, and the price was said to have been accepted under duress. The arcade was built with new wall wrapping around the small Palden Lhamo chapel which was originally also meant to be demolished.

Minimal Tibetan cosmetics applied to exterior walls only. Interior modern/Chinese. Heavy-duty concrete construction; no precast. Minimum interior space likely to be around 50,000 square metres (4,647 square metres). Heavy-duty electrical installation throughout. No indication of any residential space in early construction. Rooftop to be used as a teashop/restaurant. Could accommodate hundreds of small vendors. Rumours persist that Tibetans now selling from street stalls will be coerced to rent space in this new arcade. All skilled labour Chinese, unskilled Tibetan.

37. Private residence and shop - Small structure on southeast corner Barkor opposite the new large arcade (site No.36). All Tibetan labour with carefully executed Tibetan cosmetics. Materials and methods mostly Chinese. Lower floor will be primarily shop or restaurant space; upper floor for Tibetan owner's residence. One similar structure demolished to make way for the replacement.

38. Public housing - Rabsel area; apparently a public housing unit. One of three government or public buildings and two small private homes (site Nos. 38-42) built on a large site on a main alley leading into the southeast corner of the Barkor. Several homes were demolished to make way for the new construction. Access to the new Rabsel *Drongkhyer Uyon Lhenkhang* (Rabsel Neighbourhood Committee) assembly hall is through the gate of this unit, but it is not known what, if any, connection there may be in use. The unit has a few spacious two-storey apartments but no interior plumbing. Materials and methods were Chinese; skilled labour mixed, unskilled Tibetan. Courtyard space is unusually large but shared by three buildings.

39. Government or work-unit apartments and offices - Rabsel area; unusual structure, possibly a combination of offices and higher quality apartments. Shares a courtyard with the Rabsel *Drongkhyer Uyon Lhenkhang* (municipal neighbourhood committee). One of three government or public buildings and two small private homes (site Nos. 38-42) built on a large site on a main alley leading into the southeast corner of the Barkor. Modern in-the-wall electrical wiring and fuse panel. Flush toilets and taps; skilled labour mixed, unskilled Tibetan.

40. Government office and meeting hall - Rabsel area; large assembly hall and meeting areas for Rabsel *Uyon Lhenkhang* (Rabsel Neighbourhood Committee). One of three government or public buildings and two small private homes (site Nos. 38-42) built on a large site on a main alley leading into the southeast corner of the Barkor. Work was completed too soon for detailed observations; skilled labour mixed, unskilled Tibetan.

41. Private residence and apartment - Rabsel area; one of two private homes built on a large site along with three government or public buildings (site Nos. 38-42) on a main alley leading into the southeast corner of the Barkor. Access to the private homes is not via public buildings or courtyards. Many traditional Tibetan methods/materials. One small apartment and one large residence. Skilled labour mixed, unskilled Tibetan.

42. Private residential compound - Rabsel area; one of two private homes built on a large site along with three government or public buildings (site Nos. 38-42) on a main alley leading into the southeast corner of the Barkor. Unusual in that cosmetics are Tibetan but labour and occupants Hui Muslim.

43. Work-unit apartments - Housing apparently for a work-unit but not confirmed; inside a gated compound. Completed before detailed inspection possible.

44. Private residential compound - Small complex with three apartments for extended family. Mostly traditional Tibetan materials/methods; all Tibetan labour. Replaces single compound.

45. Buddhist Temple - Rabsel Tsenkhang Temple replaces a temple by the same name, a satellite of Sera Monastery, on the same site which was destroyed earlier. High quality traditional Tibetan construction. All labour Tibetan.

46. Private apartments - Small apartment complex; probably the largest of the residential units built privately by Tibetans in 1993. Nine apartments between the lower two floors. Upper floor occupied by owner's large suite. One fully-equipped modern bathroom on each floor. Auxiliary courtyard water tap. Construction methods and materials modern Chinese, in Indo-Nepali style, but all labour and décor Tibetan. Workmanship much better than on public housing, including attention to structural detail. Replaces one family compound.

47. Private residence - High quality, traditional Tibetan construction throughout; an extended family residence. Finely carved and painted casings, lintels and pillar capitals. Slab supported on poles laid about 20 cms (eight inches) on centre. Dowels laid in herringbone pattern, well fitted; all Tibetan labour. Replaces single compound.

48. Use unknown - Large, vacant site just south of South Barkor. Mostly demolished; previous buildings were mostly Cultural Revolution-era government structures.

49. Government-built medical clinic and offices - Behind the government pharmacy on the South Barkor. Three large rooms on lower floor probably clinic space; ten smaller offices on upper floor. Modern electrical wiring throughout. Entry area exposed to public view from Barkor Street has detailed Tibetan cosmetic touches. All unexposed *façades* Chinese. All labour Chinese.

50. Public housing - Large public housing unit near southwest corner Barkor Street on side alley. Four-storey height making it higher than nearby Jokhang Temple. No toilets on fourth floor. Single courtyard tap will serve about 135 residents. Wiring primitive, as in other public units; main switch not installed when residents ready to move in. Skilled labour mostly Chinese, unskilled Tibetan.

51. Public housing - Unique layout for public housing: some two-level apartments, roomy, with terraces. All apartments in building are of medium to large size. Water and electrical supply no better than average public units. Skilled labour mostly Chinese, unskilled Tibetan.

52. Use unknown - Multiple homes demolished late 1993 to create large site. Foundations only laid as of late 1993; configuration suggests large public housing units but no confirmation available.

53. **Work-unit apartments** - Completed before any inspection possible.

54. **Private residence** - Medium size, single-family home; many traditional Tibetan materials and methods used. Tibetan décor carefully executed. Unusually good-quality stone work now infrequently seen in Tibetan construction. All Tibetan labour.

55. **Private apartments** - Early stage of construction in late 1993; could not confirm private ownership. All labour Tibetan; materials and methods modern Chinese.

56. **Commercial/retail** - Small addition to Menzikhang (Tibetan Medical Centre) outpatient unit; Tibetan cosmetics but Chinese materials and methods. Use is commercial. Ownership unknown. Skilled labour mixed; unskilled Tibetan.

57. **Large government-built multi-use complex** - Very large complex primarily for commercial and retail use, with modern apartments surrounding interior courtyard. Residents mixed race; all labour Chinese.

58. **Large, government-built, multi-use building** - Appears commercial, but upper floors could also be used as combined business/residential space; all labour Chinese.

59. **Large, government-built, multi-use building** - Appears commercial, but upper floors could also be used as combined business/residential space; all labour Chinese.

60. **Large government-built multi-use complex** - Very large, modern; government or commercial; could be used as combined business/residential space; apartments to rear; labour Chinese.

61. **Government-built Bank of China complex** - Large, modern, commercial complex. Spacious employee housing in rear courtyards; all labour Chinese.

62. **Retail shops** - Long row of shops; retail space at ground level; possible multi-use space above, could be used as residential; all labour Chinese.

63. **Retail shops** - Long row of shops; retail space at ground level; possible multi-use space above, could be used as residential; all labour Chinese.

64. **Government or work-unit shops,** offices, residential space - Attached to large unit compound, user unknown; function appears to be multi-use; all labour mixed.

65. **Retail shops** - Long row of shops; retail space ground level; possible multi-use space above, could be used as residential; all labour Chinese.

66. **Retail shops** - Low-quality single storey; temporary construction serving as low rent shop space; renters often live in shops.

67. **Private apartments** - Early stage of construction made detailed observation impossible; some traditional Tibetan materials/methods in use; good quality; all Tibetan labour.

STATISTICAL SUMMARY

Types of Housing Constructed in the Old Quarter, 1993

	Sites	Total Apts	Estimated Capacity	Persons/ Unit	Percent of new housing
Public Housing	13	363	1,400	107	62%
Work-unit Housing	9	106	345	38	15%
Privileged Housing	6	33	190	30	8%
Private Housing	18	101	350	19	15%
Total	46	603	2,275	-	-

Note: Actual capacity of housing may be higher than these estimates due to:
- overcrowding
- family sizes which exceed government-dictated limits
- transient residents without official residence permits
- persons living in shop space

The total number of persons being rehoused in public apartments is similar to that found in the 1990 TIN Survey, which identified 374 apartments which would house a minimum of 1,430 persons.

Average number of people per water source

Public Housing	87	(based on 12 sites with known supply)
Work-unit Housing	9	(based on 6 sites with known supply)
Privileged Housing	3	
Private Housing	14	(based on 13 sites with known supply)

Average electrical supply per apartment

Public housing	1 amp @ 220 volts	(based on building main switch capacity)
Privileged housing	20-30 amps @ 220 volts	(based on fuse capacities)

Number of sites using Tibetan and Non-Tibetan construction workers
(Based on casual observations at active work sites; apartment totals are in brackets)

Skilled Labour	**Unskilled Labour**
(By total apartments constructed)	(By total apartments constructed)
Tibetan: 39% (220)	Tibetan: 94% (529)
Chinese: 61% (344)	Chinese: 6% (35)

Numbers of Tibetan and Non-Tibetan construction workers by types of housing
(Based on casual observations at active work sites; apartment totals are in brackets)

Construction type	Labour type	Tibetan	Chinese
Public Housing	skilled	30% (110)	70% (256)
	unskilled	100% (366)	0 (nil)
Work-unit Housing	skilled	10% (6)	90% (54)
	unskilled	53% (32)	47% (28)
Privileged Housing	skilled	27% (9)	73% (24)
	unskilled	100% (33)	0 (nil)
Private Housing	skilled	90% (95)	10% (10)
	unskilled	93% (98)	7% (7)

Note: These figures do not include the large, government-funded construction sites on the perimeter of the Tibetan area, mainly non-residential, where the labour is nearly 100% Chinese. The figures suggest that Tibetans are not generally employed as skilled labour on government funded construction sites in the Old Quarter, where they represent at best 30% of skilled workers on public housing projects. In contrast, they perform 90% of skilled labour on privately funded Tibetan projects. Some Tibetans allege that the authorities discriminate against employing Tibetans as skilled labourers.

New Construction in and bordering the Old Quarter: Statistics
Size, Accommodation, Water Supply

Map Key#	Probable Type	Approx Bldg. Size*	Storeys	Apts/ Floor	Total Apts.	Estimated Capa.	Water Source	Persons/ Source
1a	private hotel	60' x 90'	3	0, 9, 9	18	80	taps each floor	9
1b	private hotel	60' x 90'	3	7, 7	14		tap in courtyard	28
2	private res. & shops	30' x 30'	2	~1	~2	~6	?	?
3	retail shops	12' x 150'	1	n/a	n/a	n/a	taps at toilet	n/a
4	townhouses,govt built	35' x 75'	2	n/a	3?	18?	?	?
5	townhouses,govt built	35' x 150'	2	n/a	6?	36?	?	?
6	townhouses,govt built	35' x 125'	2	n/a	5?	30?	?	?
7	townhouses,govt built	35' x 200'	2	n/a	8	48	2 taps per home	3
8	townhouses,govt built	35' x 125'	2	n/a	5	30?	?	?
9	work-unit:comm., res.	16' x 60'	2	0, 6	6	18	tap each apt.	3
10	private res.& apartms.	30' x 40'	2	3, 4	7	17	1 courtyard tap	17
11	public housing	50' x 60'	3	4	12	46	1 courtyard tap	46
12	public housing	90' x 100'	3	8	24	91	1 courtyard tap	91
13	public housing	70' x 80'	4	10	41	156	1 courtyard tap	156
14	public housing	40' x 70'	3	4,5,5	14	53	1 courtyard tap	53
15	public housing	55' x 60'	3	7,5,5	17	65	1 courtyard tap	65
16	public housing	80' x 140'	3	~25	~75	~285	courtyard taps	??
17	private residence	16' x 25'	2	-	1	~5	none	-
18	work-unit:comm., res.	25' x 130'	2	10 (top only)	10	30	1 courtyard tap	30
19	gov't townhouses (Lhasa City gov't)	40' x 120'	2	n/a	6	24	running water kit/bath	4
20	gov't offices: (Lhasa City gov't)	45' x 165'	3 & 4	n/a each floor	n/a	n/a	running water	n/a
21	work-unit: work shops & residential	25' x 110'	3	0,5,8	13	42	1 tap in each apt.	3
22	work-unit: work shops & residential	50' x 120'	3	0,8,8	16	48	1 tap each apt.	3
23	private apartments.	45' x 70'	2	~5	~10	~35	1 courtyard tap	35e
24	private apartments	30' x 40'	3	3,2,2	7	25	taps each floor	8
25	public housing	40' x 90'	3	7	21	80	1 courtyard tap	80
26	private apartments	30' x 40'	3	-	~5	~20	1 tap in courtyard	7
27	gov't built: commercl & residential	75' x 90'	3	0,0,10	10 apts 20 shops	apts: 30 shops: 40 total: 70	2 taps each floor	6
28	gov't: local admin. & employee residential	25' x 60'	3	0,4,4 (?)	8(?)	24 (?)	??	??
29	private apartments	40' x 80'	2	~4	~8	~30	??	??
30	public housing	45' x 75'	3	10	30	114	1 tap in courtyard	114
31	public housing	40' x 75'	4	6	24	91	1 courtyard tap	91

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* The size is given here in feet. Divide by 3.281 to get metric equivalent.

New Construction in and bordering the Old Quarter: Statistics
Drains, Toilets, Electricity Supply, Labour

Map Key#	Drainage Location	Toilet Type	Toilets/ Floor	Persons/ Toilet	Bldng. Elec Service	Rated Kw/Apt	Skilled Labour	Unskilled Labour
1a	at all fixtures	flush	2	11	substantial	substantial	Chinese	Chinese
1b	at all fixtures	flush	1	20	minimal	minimal	-	Tibetan
2	?	?	?	?	?	?	?	?
3	only at single tap	chute; common Chinese style1	3m/3f	n/a	?	n/a	Chinese	Tibetan
4	?	?	n/a	?	?	?	mixed	Tibetan
5	?	?	n/a	?	?	?	mixed	Tibetan
6	?	?	n/a	?	?	?	mixed	Tibetan
7	at all fixtures	flush	1 per home	6	substantial	substantial	mostly Chinse	Tibetan
8	?	?	n/a	?	?	?	mixed	Tibetan
9	at each tap	chute; common Chinese style (1)	2m/2f 2nd only	4	substantial	adequate	Chinese	Chinese
10	only at single tap	common; chute Tibetan style (2)	2m/2f 2nd only	4	10A, 220V	0.31kw	Chinese	Chinese
11	only at single tap	none installed	none?	n/a	??	??	mixed	Tibetan
12	only at single tap	common; chute Chinese style	3m/3f	5	??	??	mixed	Tibetan
13	only at single tap	common; chute Chinese style	2m/3f	8	??	??	mixed	Tibetan
14	only at single tap	common; chute Chinese style	2m/2f	5	10A	0.16 kw	mixed	Tibetan
15	only at single tap	common; chute Chinese style	2m/2f	6	15A	0.20 kw	mixed	Tibetan
16	only at taps	common; chute	??	??	??	??	mixed	Tibetan
17	none	none	-	-	??	??	Tibetan	Tibetan
18	only at single tap	common; chute Chinese style	2m/2f	7	??	ample	Chinese	Tibetan
19	kitchen & bath	private, flush Chinese style	n/a	4	n/a	6.60 kw	mostly Chinse	Tibetan
20	each floor	flush, each floor	n/a	n/a	ample	n/a	Chinese	Tibetan
21	in each apt.	common; chute Chinese style	2m/2f	5	90A @ 220V 30A @ 380V (min.)	~1 to ~3 kw	mixed	mixed
22	in each apt.	common; chute Chinese style	3m/3f	4	??	??	Chinese	Chinese
23	only at single tap	common; chute Tibetan style	1m/1f	~8	??	??	mostly Tibtan	Tibetan
24	at each tap	flush, each floor	1	8	??	??	Tibetan	Tibetan
25	only at single tap	common; chute Chinese style	2m/2f	7	??	??	mixed	Tibetan
26	only at single tap	common; chute Tibetan style	2m/2f	5	??	??	Tibetan	Tibetan
27	at each tap	common; chute Chinese style	2m/2f	4	260A (min.)	~1 to ~3 kw	Chinese	Tibetan
28	??	??	??	??	??	??	??	??
29	??	??	??	??	??	??	Tibetan	Tibetan
30	only at single tap	common; chute Chinese style	2m/2f	10	A	0.22 kw	mostly Chinse	Tibetan
31	only at single tap	common; chute Chinese style	2m/2f (except 4th floor)	8	??	??	mostly Chinse	Tibetan

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(1) Chinese style toilet: waste holding tank is below ground level; no outlet; waste removal by pump or slopping; tank access via removable concrete slabs or cast-iron cover.

(2) Tibetan style toilet: waste accumulation at ground level; removal by shovel; access via small access door in wall of accumulation area.

Map Key#	Probable Type	Approx Bldg. Size*	Storeys	Apts/ Floor	Total Apts.	Estimated Capa.	Water Source	Persons/ Source
32	private apartments	30' x 60'	3	~4	~12	~36	1 tap, ground floor	36
33	private apartments	20' x 30'	3	~3	~8	~24	1 courtyard tap	8
34	public housing	60' x 150'	3	~12	~36	~137	2 courtyard taps	~68
35	gov't-built retail cmplx	45' x 70'	3	n/a	n/a	n/a	taps each floor	n/a
36	gov't built retail cmplx	140' x 160'	3 (+ roof)	n/a	n/a	n/a	taps each floor	n/a
37	private: retail & resdtl	20' x 30'	2	1 (top only)	1	5	??	5
38	public housing	25'x 120'	3	7,5,8	20	76	1 courtyard tap	76
39	gov't or unit: res apts	20' x 50'	3	3	9	32	2 taps each floor	5
40	gov't office & hall: Rabsel *Uyon Lhenkhang*	30' x 50'	2	n/a	n/a	n/a	via courtyard	n/a
41	private res.& aprtmts.	14' x 40'	2	1	2	7	1 courtyard tap	12
42	private residence	30' x 40'	2	2	4	10	1 courtyard tap	10
43	work-unit: apartments	40' x 70'	3	~8	~24	~84	courtyard tap(s)	~42 (?)
44	private residence	20' x 40'	2	-	3	12	1 courtyard tap	12
45	Buddhist Temple	40' x 50'	2	n/a	n/a	n/a	1 courtyard tap	n/a
46	private apts,residence	30' x 90'	3	5,4,1	10	40	taps each floor & courtyrd	~8
47	private residence	25' x 60'	2	-	~4	~14	1 courtyard tap	14
48	??	70' x 140'	??	??	??	??	??	??
49	govt:medical clinic	30' x 75'	2	n/a	n/a	n/a	taps each floor n/a	
50	public housing	60' x 75'	4	9	36	137	1 courtyard tap	137
51	public housing	65' x 70'	3	4	16	64	1 courtyard tap	64
52	public housing (?)	70' x 110'	??	??	??	??	??	??
53	work-unit: apartments	25' x 70'	2	~5	~10	~35	??	??
54	private residence	25' x 35'	2	-	~2	~8	1 courtyard tap	8
55	private apartments (?)	25' x 35'	2	~4	~8	~28	??	??
56	comm. or retail	30' x 60'	1 & 2	n/a	n/a	n/a	??	??
57	gov't or work-unit: office/comm/residential	150' x 200'	3 & 4	n/a	??	??	taps each floor	??
58	comm./office/residtl.	40' x 200'	3	n/a	n/a	n/a	??	??
59	gov't: Lhasa City (?) comm./office/residential	75' x 75'	3	n/a	n/a	n/a	??	??
60	gov't or work unit: comm./office/residential	200' x 200'	4 & 5	n/a	n/a	n/a	??	??
61	gov't: Bank of China comm./office/residential	150' x 150'	3	n/a	n/a	n/a	??	??
62	retail shops	12' x 175'	2	n/a	n/a	n/a	??	??
63	retail shops	12' x 260'	2	n/a	n/a	n/a	??	??
64	gov't or work-unit: retail/office/residential	40' x 60'	3	??	??	??	??	??
65	retail shops	18' x 300'	2	n/a	n/a	n/a	??	??
66	retail shops	12' x 175'	1	n/a	n/a	n/a	??	n/a
67	private apartments	60' x 80'	2	~4	~8	~28	1 courtyard tap	28

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* The size is given here in feet. Divide by 3.281 to get metric equivalent.

Map Key#	Drainage Location	Toilet Type	Toilets/ Floor	Persons/ Toilet	Bldng. Elec Service	Rated Kw/Apt	Skilled Labour	Unskilled Labour
32	only at single tap	common; chute Chinese style	2m/2f	3	20A	0.40	Tibetan	Tibetan
33	only at single tap	common; chute Tibetan style	1m/1f	4	??	??	Tibetan	Tibetan
34	only at courtyrd taps	common; chute Chinese style	2 (2m/2f)	6	??	??	mostly Chinse	Tibetan
35	at taps	??	??	n/a	ample	n/a	Chinese	Chinese
36	at taps	??	??	n/a	ample	n/a	Chinese	Tibetan
37	??	??	??	??	??	??	Tibetan	Tibetan
38	only at single tap	common; chute Chinese style	2m/2f	7	??	??	mixed	Tibetan
39	at taps	flush (1st,2nd fl)	2m/2f	4	ample	ample	mixed	Tibetan
40	n/a	none in bldg. (access via courtyard)	n/a	n/a	??	n/a	mixed	Tibetan
41	only at single tap	??	??	??	??	??	mixed	Tibetan
42	only at tap	common; chute Chinese style	1m/1f	5	??	??	mixed	Tibetan
43	only at taps	common; chute Chinese style	??	??	??	??	??	??
44	only at tap	common; chute Tibetan style	1m/1f	6	??	??	Tibetan	Tibetan
45	only at tap	common; chute Tibetan style	n/a	n/a	??	??	Tibetan	Tibetan
46	at all taps	flush	1	13	??	??	Tibetan	Tibetan
47	at single tap	common; chute Tibetan style	1m/1f	~7	??	??	Tibetan	Tibetan
48	??	??	??	??	??	??	??	??
49	at taps	common; chute Chinese style	n/a	n/a	ample	n/a	Chinese	Chinese
50	only at single tap	common; chute Chinese style	3m/3f (none 4th fl)	8	??	??	mostly Chinse	Tibetan
51	only at single tap	common; chute Chinese style	3m/3f	4	??	??	mostly Chinse	Tibetan
52	??	??	??	??	??	??	??	Tibetan
53	??	??	??	??	??	??	??	??
54	only at single tap	common; chute Tibetan style	1m/1f	4	??	??	Tibetan	Tibetan
55	??	??	??	??	??	??	Tibetan	Tibetan
56	??	??	??	??	??	??	mixed	Tibetan
57	at taps	??	??	??	ample	ample	Chinese	Chinese
58	??	??	??	??	??	??	Chinese	Chinese
59	??	??	??	??	??	??	Chinese	Chinese
60	??	??	??	??	??	??	Chinese	Chinese
61	??	??	??	??	??	??	Chinese	Chinese
62	??	??	??	??	??	??	Chinese	Chinese
63	??	??	??	??	??	??	Chinese	Chinese
64	??	??	??	??	??	??	mixed	mixed
65	??	??	??	??	??	??	Chinese	Chinese
66	??	??	n/a	n/a	??	n/a	Chinese	Chinese
67	only at single tap	common; chute Tibetan style	2m/2f	7	??	??	Tibetan	Tibetan

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End